Community, comparisons and subjective well-being in a divided society

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PII: S0167-2681(07)00097-2
DOI: doi:10.1016/j.jebo.2007.03.004
Reference: JEBO 2097

To appear in: *Journal of Economic Behavior & Organization*

Received date: 9-9-2005
Revised date: 26-3-2007
Accepted date: 26-3-2007

Please cite this article as: Kingdon, G.G., Knight, J., Community, Comparisons and Subjective Well-being in a Divided Society, *Journal of Economic Behavior and Organization* (2007), doi:10.1016/j.jebo.2007.03.004

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March 2006

Abstract

Using a South African data set, the paper poses six questions about the determinants of subjective well-being. Much of the paper is concerned with the role of relative concepts. We find that comparator income, when measured as the average income of others in the local residential cluster, enters the household's utility function positively (close neighbors are 'positives', not 'negatives') but that the income of more distant others enters negatively. The ordered probit equations indicate that, as well as comparator groups based on spatial proximity, race-based comparator groups are important in the racially divided South African society. It is also found that relative income is more important to happiness at higher levels of absolute income. Potential explanations of these results, and their implications, are considered.

Keywords: Subjective well-being; happiness; comparator groups; altruism; envy; relative deprivation; standard-setting; race; South Africa.

JEL classifications: D60, D62, D63, D64, A12, I30

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Acknowledgements:
We are very grateful to Marcel Fafchamps, John Helliwell, Karla Hoff, Carol Graham, Alan Krueger, Valerie Møller, Frances Stewart, and two anonymous referees for perceptive comments. We are also grateful to participants at the CSAE Conference (Oxford), the NEUDC Conference (Montreal) and the DPRU Conference (Cape Town) for useful feedback. Any errors are ours.

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1. Introduction

In this paper we pose several questions about the determinants of subjective well-being. We do so for South Africa, a country that, because of its unusually divided society, provides a good case study of the effects of community and comparisons on subjective well-being. Each of these questions is new for South Africa. More broadly, the major contribution of the paper to the economic literature on subjective well-being concerns the role of comparisons made with others in the community. What are the reference groups against which people compare themselves, and do their comparisons give rise to fellow-feeling or to feelings of relative deprivation? We highlight the roles that space and race can play. Spatially defined reference groups are shown to have a positive effect on subjective well-being, suggesting that neighbors may be 'positives' and not 'negatives'. By contrast, racially defined reference groups are shown to have a negative effect, implying that relative deprivation may be experienced in relation to others of one's own race rather than to neighbors or to the larger society. There are interesting implications for welfare economics and for policy.

In Section 2 we provide a framework of concepts and literature about the effects of comparisons on subjective well-being.. Section 3 describes the South African context and the data, and outlines the method: the estimation of subjective well-being functions that include explanatory variables representing relevant comparisons. The empirical Section 4 presents the results, question by question. In particular, we test whether and how spatial and racial comparisons affect subjective well-being.. Section 5 concludes and draws out the implications of the analysis.

2. Concepts and literature

The idea that relative position matters to individual utility has substantial support and acceptance in the social science literature, particularly in sociology (for instance, Runciman 1966) and psychology (for instance, Diener and Biswas-Diener 2000). By contrast, mainstream microeconomic theory generally treats utility as a function of own absolute income. However, some economists have advocated models in which the income of others enters the individual's utility function (prominent among them being Duesenberry 1949, Easterlin 1974, 1995, Scitovsky 1976). Frank (1985), Akerlof and Yellen (1990), Frank and Sunstein (2001) and Layard (2005a, 2005b) have argued that some well-established ideas about economic policy would be overturned if relative income were to matter.

There is now also a good deal of empirical support for the notion that subjective well-being depends on relative income (Clark and Oswald 1996, Watson et. al. 1996, Tsou and Liu 2001, Luttmer 2005, van Praag and Ferrer-i-Carbonell 2004). In some of the studies, utility depends more importantly, or even only (Groot and van den Brink 1999), on relative rather than on absolute income. One study finds that pay satisfaction depends not only on relative income but also on ranked position within a comparison set (Brown et. al. 2003). A study on Nepal finds that perceived consumption adequacy falls as ward (village) mean consumption expenditure rises (Fafchamps and Shilpi 2006).

Analysis of this sort requires that the comparison set, the group with whom individuals compare themselves when judging their relative position, be specified. Candidates for an individual's reference group are the individual's own past, her aspiration or desired future, others in her family, her spouse, others with similar characteristics, and others in her residential vicinity or workplace. Since individuals have different identities in different contexts, they may also have more than one comparator group. Various definitions of comparator group are found in the literature. Many studies have used 'others with similar characteristics'. For instance, an individual may match with others on the basis of educational level, occupation, gender, family background, race or region.

What is the expected sign of the relationship between relative income (or other relative measures) and individual happiness? In general it is posited that subjective well-being varies inversely with the incomes of relevant others (for instance, Easterlin 1995, Falk and Knell 2004). In much of the applied literature that tests it, comparator income is indeed found to have a negative effect on the subject's happiness level. The negative relationship is likely to arise from feelings of relative deprivation, which Runciman (p.11) defined as follows:

A is relatively deprived of *X* if (i) he does not have *X,* (ii) he sees some person or persons, which may include himself at some previous or expected time, as having *X,* (iii) he wants *X,* and (iv) he sees it as feasible that he should have *X.*

Karl Marx (1849, p.163) had developed a similar idea:

Our desires and pleasures spring from society; we measure them, therefore, by society and not by the objects which serve for their satisfaction. Because they are of a social nature, they are of a relative nature.

One reason for feelings of relative deprivation could be a sense of unfairness, or of envy, or of rivalry with others in the reference group. A more benign interpretation is also possible, for

instance that the reference group provides standards or goals to which the individual aspires. Yet another motive was suggested by Adam Smith (1776, p. 466) in the *Wealth of Nations*:

> By necessaries I understand not only the commodities which are indispensably necessary for the support of life, but whatever the custom of the country renders it indecent for creditable people, even of the lowest order, to be without.

In his view such customary goods were necessary for the avoidance of shame. Whatever the motive for feelings of relative deprivation (envy, aspirations or shame) we expect a negative effect of reference group income on own happiness.

There are also reasons why the effect of comparator income can be positive. One such reason is altruism or fellow-feeling. In his *Theory of Moral Sentiments*, Adam Smith (1759 , pp. 255-79) argued that it is in human nature to be altruistic towards other people, although there is an order in the exercise of human benevolence, from those we know well to those we know little. The view that people are altruistic is supported by the findings of an experimental game study by Charness and Grosskopf (2001, p. 302). Given that the subjects' own payoffs are fixed, the authors find

> … a surprisingly low propensity to prefer lower payoffs [for others]: people generally choose to maximize the material payoffs to others, even when they are greater than their own.[1]

Similarly, Charness and Rabin (2002) use experimental games to argue that people feel positively about the income of others and that people are motivated by reciprocity.

Risk-sharing within a community can provide another reason why own happiness is raised by other peoples' income. Members of a community may provide each other with mutual social insurance (Ligon et al 2002). In developing countries, there is commonly an absence of formal insurance mechanisms. This lack of formal instruments is particularly important in high unemployment economies and economies with high dependence on risky agriculture. The literature on risk-sharing in developing country contexts attempts to identify the household's insurance or risk-pooling group. Since the cost of enforcement and monitoring of contracts increases with the size of and distance between members of the group, an obvious unit in which to observe insurance is the village or neighborhood. Townsend (1994) finds for rural India that the village is indeed the relevant insurance group. However, Grimard (1997) uses anthropological literature on Cote d'Ivoire to suggest that the insurance group is not the village but a spatially diversified network of members of the same ethnic group. Bowles and Gintis

[1] Participants were undergraduate students; they were not told the identity of their partners in the game.

(2004) develop a model in which ethnic, or 'parochial', networks cooperate not through altruism but through reciprocal benefits derived from the promotion of trust within the network.

It is also possible that there is a positive relationship between own happiness and community social capital or education. Helliwell (2001), citing the psychological literature, has argued that social capital (defined as 'networks, norms and understandings that facilitate cooperative activities') can have a positive effect on subjective well-being. For instance, it is possible that social capital or education in a community creates positive externalities for its members, if well-being is raised by networking with people who have higher levels of community involvement or education.

The composition of the reference group and 'social distance' may be closely related. In *The Theory of Moral Sentiments*, Adam Smith (1759, p. 157) asked whether a person would be more disturbed by the loss of a hundred million lives in China or by the loss of his own little finger. He argued that sympathetic feelings would be aroused by the great loss of life in a faraway country but that those feelings would be attenuated by the physical and social distance. He suggested (1759, p. 270) that it is natural to care most about the 'order and society' to which one belongs.

There is psychological evidence that people's satisfaction depends on their social comparisons with others whom they perceive to be relevant comparators, and that these are people who have similar attributes (Goethals and Klein, 2000). This accords with the hypothesis that, the motive for social comparison being to evaluate one's self-standing, the chosen comparators are people "close to one's own ability or opinion" (Festinger, 1954, p.121).

Akerlof (1997), in modelling social distance, argued that social interaction can influence individual decisions and aspirations and that social interaction is inversely related to social distance. Moreover, there is a large experimental game literature on social distance suggesting that people feel differently about those who are closer in some sense (see, for instance, Charness and Gneezy 2007, Charness et al. 2007, Cox and Deck 2005, and Hoffman et al. 1999).

Social distance can also have an attenuating effect on a positive relationship arising from social insurance. People are more likely to share risks within a small community, where they can know and trust each other, than within a large community. The same is true of the argument made in

terms of social capital: own happiness is likely to be based on the extent of social interaction as well as on its quality. If the attenuation of a positive relationship with social distance is stronger than that of a countering negative relationship, it is possible for a net positive effect in a small community to give way to a net negative effect in a large community.

Social distance can also diminish feelings of relative deprivation. Robert Roberts' (1971) account of life in a Salford slum in Edwardian England illustrates how this can happen. The slum-dwellers, he claimed, did not make comparisons between themselves and people outside the slum: the strata of society were recognized without question and respect for their 'betters' and 'superiors' was firmly established. But within the working class, comparisons were constantly made and social rating was of great importance. Despite desperate poverty, 'envy was the besetting sin', but only inside the slum (Roberts, pp.23-5).

An obvious measure of social distance is physical distance. This suggests the need to investigate the role of relativities according to the size of locality, such as neighborhood, village, town, city, and region. The hypothesis is that the effect of locality income (whether positive or negative) diminishes as the size of the locality, and thus of the community, increases.

Akerlof and Kranton (2000) have argued that 'identity' (i.e. a person's sense of self) affects individual behavior and aspirations. Race and ethnicity can provide a strong basis for identity, possibly because of their innateness and immutability. In a society with sharp racial divisions, aspirations may be related to what can be achieved by persons of one's own race. If race identifies the reference group, race-based relativities may be important. However, that in itself does not indicate whether the income of the race group has a positive or negative effect on own happiness. It is possible that space and race interact, that the reference group is best defined by the race group within a small locality.

To the extent that happiness depends on the gratification of certain biological and physiological needs, it is not relative (Veenhoven, 1991). By contrast, Pigou (1920) reasoned that since the rich derive much of their satisfaction from relative rather than absolute income, satisfaction would not be reduced if the incomes of all rich people were diminished at the same time. In a similar vein, others have posited that in affluent societies, spending increasingly becomes a means to achieve social status rather than to meet economic needs (Veblen, 1899), or that perceived needs change with the general level of affluence of others (Schor, 1998). Easterlin

(1995) argues that absolute income matters up to a certain level, after which relative income increasingly matters.

Much of the economic literature on the importance of relative concepts treats people's reference groups as given, yet they could be endogenously chosen by individuals in the pursuit of certain goals (Falk and Knell). Nesse (2004) similarly rejects the notion that our 'salient others' are shaped by our culture and genes, suggesting that attention be paid to how individuals, in trying to satisfy particular psychological desires, create their own social groups. Feelings of relative deprivation can be reduced if people narrowly confine comparisons to others with whom they identify, perceived by race or class. There may be a conscious or unconscious tendency to do this when it is perceived that the disadvantage cannot be remedied. If a person is strongly motivated for self-improvement, she may make comparisons upwards, with others superior to herself. On the other hand, where self-enhancement is important, she may select for comparison people who are inferior if that makes her feel better. Such choices can induce acts of self-selection into particular reference groups, for instance via migration or residential relocation (Stark and Taylor 1991). The endogeneity of comparator groups can be investigated only with information on individuals' goals, either from attitude surveys or from revealed preferences such as migration to richer or poorer neighborhoods.

3. Context, data and method

In South Africa race was the defining feature of society until the end of apartheid, with most aspects of life being governed by racial segregation. For instance, different education departments catered for the education of the four races (African, Coloured, Indian, and White), and there was a marked racial hierarchy in resource allocations to schools. There were restrictions on the movement and migration of non-Whites, and they had been debarred from entering certain higher positions of employment. In such a racially divided society, race may be an even greater source of identity than it is elsewhere, and it is very likely that people's aspirations are, or were, at the time of our survey (just before the formal end of apartheid), linked to what they believed to be the range of states attainable for persons of their own race[2].

[2] See Møller (2002).

Our data come from the SALDRU national household survey of 1993 in South Africa carried out by the South African Labour and Development Research Unit (SALDRU) of the University of Cape Town. Patterned on the World Bank's Living Standards Measurement Studies, the dataset contains information on about 8800 households, with modules on household demographics, employment, health, income and expenditure, and so on, as well as community information.

The SALDRU survey was a household survey in which a sample of households, designed to be representative of the national population, were visited and interviewed by trained enumerators (SALDRU, 1994). Section 9 of the survey is on perceived quality of life. It contains, *inter alia*, the question: "Taking everything into account, how satisfied is this household with the way it lives these days?" The five options available in the pre-coded response are 'very satisfied', 'satisfied', 'neither satisfied nor dissatisfied', 'dissatisfied', and 'very dissatisfied'. The proportion of households reporting these answers were 7.5, 26.4, 9.4, 33.4 and 23.4 percent respectively. This question forms the basis of our empirical analysis.

Whereas an individual member of the household responded to the survey question, the question itself related to the satisfaction of the household as a whole rather than to that individual's personal well-being. This raises the possibility that the individual answered mostly with his own personal satisfaction level in mind rather than that of the household as a whole. In order to address this concern, we check the robustness of the findings to the inclusion of the individual respondent's own personal characteristics as explanatory variables. Appendix Table 1 shows that, controlling for household characteristics, individual characteristics are generally unimportant in our subjective well-being equations. This is unsurprising not only because of the question posed but also because there are likely to be interdependencies in well-being among members of the household.

The reference groups that we investigate are defined by race (four races are identified in the survey: African, Coloured, Indian and White) and space (enumeration cluster, district and province). The four races are distributed in the survey in the proportions 71% African, 8% Coloured, 3% Indian, and 18% White. Unfortunately we do not have the information (on personal goals or on migration) to investigate the possible endogeneity of space-based reference groups. 360 clusters, 187 districts, and 9 provinces are included in the survey. The average size of their populations is 2,900**,** 125,400 and 4.46 million respectively, and the average number of

observations 25, 47, and 983 households respectively. Clusters, which play a prominent role in our analysis, were randomly selected units corresponding to a rural village or to all or part of an urban suburb. Race- and space-based reference groups are also combined. However, whereas it is possible to conduct an analysis of race within districts, there are too few observations in each cell to analyse race at the cluster level; in any case, most clusters are racially homogenous.

We begin with the subjective well-being function:

$$W_i = \alpha + \beta X_i + \gamma Z_i + \varepsilon_i \qquad (1)$$

where W_i represents reported well-being of the *i*th individual or household and X is a vector of socio-economic variables and Z a vector of various relative concepts (such as relative income, employment and education). Our measure of W_i is available as a multiple choice variable (effectively, "is your household 1. very dissatisfied; 2. dissatisfied; 3. so-so; 4. satisfied; 5. very satisfied?"). Since there is an inherent ordering, the appropriate estimation procedure is by means of an ordered probit model.

4. Empirical results

Table 1 sets out the notation, definitions, means and standard deviations of the variables used in the analysis. *Column (a)* of Table 2 presents a general specification of the ordered probit equation of subjective well-being, together with the marginal effects of the variables on the probability of being 'satisfied' or 'very satisfied' with life. *Column (b)* provides an OLS equation of the same specification. Province dummies are included but not reported. In this table and subsequent tables, the explanatory variables are divided up into 'control variables' and 'hypothesis variables' (the variables required to test our six hypotheses).

The ordered probit and OLS results are very similar: there are no differences at all in sign, and the significance levels are the same for each of the hypothesis variables. This finding confirms that of Ferrer-i-Carbonell and Frijters (2004) who examined the robustness of findings on the determinants of happiness using a household panel survey and found that their results were not sensitive to the choice between latent variable and OLS methods.

In several respects, the equation is similar to that found in other studies (Helliwell 2002, Graham and Pettinato 2002, Di Tella et al. 2001, Winkelmann and Winkelmann 1998): subjective well-

being falls with age and then rises; is increasing in health, education and income; and falls with unemployment. Consider the size of these effects. An increase in absolute household income (log of household per capita income, *ln_hhpci*) from one standard deviation below to one standard deviation above the mean raises the probability of being satisfied or very satisfied with life by 11 percentage points. Considering that overall probability of being satisfied or very satisfied is 33 per cent, this is not a dramatic increase for the large implied increase in income. The *African* probability of being satisfied or very satisfied is 21.5 percentage points lower than that of *Whites*, even after controlling for observed income, education, employment, and so on. Those who live in metropolitan cities (*metropol*) are 10 percentage points less likely to be in the highest two subjective well-being categories than are rural-dwellers (omitted category). The household unemployment rate (*hhurate*) has a modest effect on the probability of being in the top two happiness categories. Going from one standard deviation below to one standard deviation above the household unemployment rate reduces that probability by 4.1 percentage points. The effects of higher education (*higher*), health (*hhdaysic*), crime (*n_victim*), household assets (*assetval*), and debt (*debt*) are all as expected and statistically significant but small.

4.1. Space-based comparator groups

Table 3 explores the role of space-based relative concepts in determining happiness. This is done by including, in the happiness equation, the average income, unemployment rate and years of education of households in the cluster, and in the district, calculated by averaging household characteristics within the cluster, and the district, but excluding each household's contribution to the average. The full set of control variables, corresponding to the specification of Table 2 is included in all cases, but only relevant control variables and the hypothesis variables are presented in the table.

The household's absolute income (*ln_hhpci*) raises and the household unemployment rate (*hhurate*) depresses happiness significantly. The first relative concept we consider is relative unemployment, defined as the unemployment rate of others in the cluster and then in the district. The cluster mean household unemployment rate (*c_hhurate*) reduces happiness significantly. *Column (b)* adds the district average of household unemployment rate (*d_hhurate*). This has no relationship with household happiness, but the cluster unemployment variable continues to reduce household happiness significantly. The second relative concept considered is others' education. *Columns (c)* and *(d)* respectively add cluster and district averages of years of education. Cluster education (*c_hhedyrs*) enters positively and significantly and district

education (*d_hhedyrs*) negatively but insignificantly. The final relative concept considered is others' income. *Column (e)* adds cluster average income (*c_lnhhpci*). This enters positively and significantly. *Column (f)* adds district average income (*d_lnhhpci*), and this enters negatively but insignificantly.

An interesting and consistent pattern thus emerges: within the cluster, households derive happiness from others' income success but within a wider area, the district, they may compete with others. When all three dimensions (unemployment, education and income) are added together in *column (g)*, the spatial education and unemployment rates no longer matter, conditional on income. Only the income dimension is significant: the income of others within the cluster increases happiness, but income within the district weakly decreases happiness.

These are fascinating results: within the local cluster, other people's income produces positive externalities on the household's utility. Only when the comparator group is widened to include more distant others (those in the district as a whole) does other people's income appear to create negative spill-overs.

The results have four possible explanations. One is that households within a cluster share risks with each other (i.e. provide mutual insurance and support). The expectation of reciprocity causes people who live in a risky environment to value the income of their reference group. This is plausible when there is high unemployment and widespread lack of unemployment insurance, as in South Africa. To test this explanation we estimated the well-being equations separately for Africans and for Whites, since Africans have a higher unemployment rate (39% compared with 5% for Whites) and much poorer access to formal insurance mechanisms. The estimates showed that the positive effect of mean cluster income on household well-being is the same for both races. The coefficient for Africans is 0.271 (t = 4.28) and for Whites 0.272 (t = 4.56). This result is inconsistent with the mutual insurance explanation.

A second interpretation is that cluster income serves as a proxy for the 'social wage' (i.e. in better-off clusters, the level of public and other amenities such as education, health, sanitation, etc. is higher). We conducted the following test of this hypothesis. We first removed all cluster-level variables and introduced cluster dummy variables instead. The estimated cluster coefficients were then regressed on community amenities and cluster income together with a set of control variables: the results are shown in Table 4. Six community variables are available in

the data set (whether roads become impassable, whether there are tarred roads, whether public transport is available, distance to the nearest source of public transport, number of community facilities, and distance to various facilities). However, none has a significant coefficient, nor are they jointly significant. By contrast, the coefficient on cluster income is positive and significant. We can find no evidence to support the social wage explanation. However, we cannot rule out the possibility that unobserved community facilities, if they are positively associated with cluster average income per capita, are driving the positive relationship between cluster income and subjective well-being

There is a third, econometric, explanation: either that cluster mean household income and household income are positively collinear and cluster income is picking up some of the effect that is attributable to household income, or that household income is measured with error and cluster income is serving as a proxy for household income. We explored these possibilities by regressing household income (*lnhhpci*), and also cluster mean income (*c_lnhhpci*), on a full set of household-level explanatory variables. The high value of R-squared (0.558) in explaining the former suggests that household income is not subject to serious measurement error. Even if it were, the fact that the same set of explanatory variables can explain 56 % of the variation in household mean income but only 40 % of the variation in cluster mean income suggests that cluster income cannot serve as a good proxy for household income.

The fourth possible explanation is that people are altruistic towards others in their own clusters, that is, clusters are treated like extended families, but people feel relatively deprived when the spatial orbit is widened to the district. It is pertinent to note that the cluster is a geographically small unit within which households are likely to know each other[3]. Pursuing this idea, whereas the average cluster contained 580 households, we divided households into two groups, those living in smaller clusters (containing no more than 200 households) and those in larger clusters (with more than 200 households). Compared to the coefficient on the cluster mean income variable for the sample as a whole (0.221, robust t = 5.1)[4], the coefficient increases to 0.308

[3] The documentation for the SALDRU survey states, "The sampling frame was drawn up on the basis of small, clearly demarcated area units [clusters], each with a population estimate… For most of the country census ESDs [Enumeration Sub-Districts] were used. Where some ESDs comprised relatively large populations as for instance in some black townships such as Soweto, aerial photographs were used to divide the area into blocks of approximately equal population size. In other instances, particularly in some of the former homelands, the area units were not ESDs but villages or village groups."

[4] *Column (e)* of Table 3.

(robust t = 4.6) for households in small clusters and falls to 0.058 (robust t = 0.69) for those in large clusters. Thus, the relationship is powerful in small clusters and weak or absent in large clusters. These results provide support for the explanation in terms of altruism or fellow-feeling in a close community.

The finding of positive externalities from others' incomes is noteworthy in the light of studies that find a negative externality from the income of others in the locality. The size of the locality may be crucial. For instance, Luttmer found "neighbors" to be "negatives" in the United States but the "public use microdata areas" (PUMAs) that he used had an average of 150,000 inhabitants and so were hardly neighbourhoods. Indeed the average PUMA is larger than the average South African district. There is no necessary inconsistency with our study.

4.2. Race-based comparator groups

We turn to the role of racial concepts in determining happiness, particularly the hypothesis that the relevant comparator group for the household is other households of the same race (Table 5). Systematic racial segregation in apartheid South African society made it plausible that people's aspirations were linked to what they believed to be the highest states attainable for persons of their own race. We tested for race-relative effects in two ways: firstly, income relative to that of others of the same race within the district and, secondly, the same concept applied at the national level.

The high correlation between household income and the relative position of the household in the national income distribution rules out the inclusion of both together in a subjective well-being function. However, this is not the case for race-based income distributions. For instance, a household with the average per capita income of the sample as a whole (Rand 671) would be in the fifth (i.e. top) quintile of its race-specific income distribution if it were African, the fourth quintile if it were Coloured, the third quintile if it were Indian, and the first (i.e. lowest) quintile if it were White.

Column (a) of Table 5 repeats the best specification from Table 3 (includes space-based relative income measures). *Column (b)* includes the natural log of race-specific district mean income (*lrdm_inc*). This enters negatively and has a large coefficient, although it is only weakly significant. It suggests that relative deprivation does play a part in the determination of happiness. Controlling for household income, the higher the income of others of the same race

in the district, the lower is subjective well-being. It is notable that the coefficient on the race-specific mean income in the district, in *column (b)*, has a bigger negative value than that on (overall) mean income in the district, in *column (a)*. In *column (b)*, where both of these variables are included, only the race-specific variable is significant. *Column (c)* accordingly drops the insignificant variable *d_lnhhpci*. In this column the marginal effect (not reported) of *lrdm_inc* on the probability of being satisfied or very satisfied is -0.2145. Thus, if race-specific district mean income increases by one standard deviation (0.989) from its mean (5.946), the probability of being satisfied or very satisfied with life falls by a large 21.2 percentage points.

Column (d) includes the household's quintile position in the race-specific national distribution of income (*r_pciq2* to *r_pciq5*), households in the poorest race-specific income quintile (*r_pciq1*) being the base category. The household's absolute income (*ln_hhpci*), although positive, is no longer statistically significant. It cannot be argued that the household's income quintile position simply proxies its absolute income because the same income places households of different races in very different race-specific income quintiles. For instance, a regression of *ln_hhpci* on the *r_pciq2*, *r_pciq3*, *r_pciq4*, and *r_pciq5* dummy variables yields an adjusted R-squared of only 0.547[5]. The implication is that, for instance, a White household and an African household with the same income can differ in their subjective well-being because they belong to different race-specific income quintiles.

We perform a counterfactual calculation on the basis of the results in *column (d)*. Consider an African and a white household possessing identical characteristics and income, both with the average characteristics and income of the sample as a whole. First, introduce the fact that the African household is in the highest race-specific income quintile and the white household is in the lowest. This creates a difference in the probability of being satisfied or very satisfied with life in favour of African household of 12.5 percentage points. Second, take into account the fact that the African dummy variable (the white dummy being the default category) has a large negative coefficient. This reduces the probability of the African household being satisfied or very satisfied by 23.4 percentage points. Thus, the disadvantage of being African greatly outweighs the advantage of being a relatively rich African.

[5] In any case, we would expect the continuous variable (*ln_hhpci*) rather than the dummy variables *r_pciq2* to *_pciq5* to 'pick up' the effect of income because there is far more variation in the former than in the latter, but it does not. However, we do not wish to conclude that absolute income does not matter to subjective well-being; in our other specifications, absolute income does matter significantly.

4.3 Interaction between absolute and relative income

We ask whether the importance of relative income varies with absolute income. We do so by examining whether relative income affects subjective well-being differently among poor and non-poor households. Households whose per capita income falls below the 'household supplementary level' poverty-line of Rand 251 per month in 1993 (a measure of what is required for basic subsistence are defined as 'poor' households and the rest as 'non-poor'. We use the split-sample approach, which is equivalent to the conventional approach of interacting the poverty dummy variable with the regressors.

Table 6 compares the determinants of happiness for the poor and non-poor. A number of control variables are presented because they show some interesting contrasts.[6] Poverty is more detrimental to the perceived well-being of elderly households than of younger households; those with a high proportion of persons aged 66 or over are significantly happier than those with a corresponding proportion of persons aged 36-45, but only if they are above the poverty line. By contrast, poverty does not matter to households with a high proportion of 16-25 year-olds, which are happier than those with a corresponding proportion of 36-45 year-olds irrespective of whether they are above or below the poverty line. Vicissitudes such as sickness (*hhdaysic*), crime (*n_victim*), and indebtedness (*debt*) matter more to the poor than they do to the non-poor. However, unemployment (*hhurate*) matters significantly more to the non-poor than to the poor. This apparently counter-intuitive result may be due to the fact that the poor mostly live in high unemployment areas where one's own unemployment appears less blameworthy or more acceptable because a high proportion of acquaintances are also unemployed. This explanation was tested by fitting happiness equations separately for low and high unemployment areas. It showed that unemployment depressed perceived well-being significantly only in lower than mean unemployment rate areas (the coefficient and robust t-value of *hhurate* in high and low unemployment areas were -0.097 (t = -1.5) and -0.399 (t = -4.0) respectively).[7]

Our hypothesis is that absolute and relative income have different effects in the two sub-samples. This is tested using race-specific district mean income as the relative income variable.

[6] The apparent difference in the effect of race is spurious since there are virtually no Whites (only 0.6% of the poor) below the poverty line (i.e. in the base race category in the first column).
[7] Other studies also find that the unemployed suffer less in high unemployment areas (Clark, 2003; Powdthavee, 2005).

The log of household per capita income (*lnhhpci*) is significantly positive for both poor and non-poor but, whereas the coefficient on log of race-specific mean district income (*lrdm_inc*) is not significant for the poor, it is negative, significant and large for the non-poor. Absolute income matters for both groups[8] whereas the variable representing relative deprivation reduces the well-being of the non-poor but not of the poor.

We conducted various checks on the robustness of this set of results. Experimentation with another poverty line (the 'supplementary living level', equal to Rand 220 per month in 1993) makes no difference to any of the patterns[9]. We also divided the sample into terciles and compared the lowest and the highest tercile. Again, in both specifications, absolute income mattered to the poorest third and relative income to the richest.

5. Robustness checks

Various tests of the robustness of the income results are reported in Table 7; these tests involve price deflation of income, collinearity of income with other variables, endogeneity of income, and errors in income measurement. Although spatially disaggregated consumer price levels are not available, it is possible to adjust income for differences in cluster food price indices, weighted for the importance of food in household expenditure. *Column (a)* shows an ordered probit with deflated income that is precisely comparable to the basic equation in Table 2. The coefficient on the log of income (*lnhhpci*) falls only from 0.116 to 0.095. *Column (b)* adds the cluster and district mean income variables to this specification. By comparison with the corresponding equation using undeflated income (*column (f)* of Table 3), the cluster mean income coefficient falls (from 0.265 to 0.175) but remains significantly negative. *Columns (c)* and *(d)* are OLS equations; the former corresponds to the specification in Table 2 except that it includes the spatial mean income variables whereas the latter omits from that equation those variables that are likely to be positively associated with household income. The effect of this omission is to raise somewhat the coefficients on both *lnhhpci* and *c_lnhhpci*.

Ferrer-i-Carbonell and Frijters, using panel data on happiness, show that the coefficient on income in their fixed effects model is lower than that in their cross-section OLS model, and they attribute this to time-invariant unobserved determinants of happiness biasing upward the cross-

[8] The coefficient is actually greater for the non-poor than for the poor but the difference is not statistically significant.
[9] The poverty lines are obtained from May (1998).

section estimate. It is therefore worth testing for the possible endogeneity of our income variables. Using the *column (d)* specification, *column (e)* instruments the log of household per capita income (*lnhhpci*) with the log of household per capita consumption expenditure (*lnhhpce*). Expenditure seems to be a reasonable instrument for income since it is unlikely that measurement error in per capita income will be correlated with measurement error in per capita expenditure. The effect of instrumenting is to raise the coefficient on income from 0.120 to 0.252, both highly significant. However, we would expect instrumenting to reduce the coefficient insofar as it corrects for endogeneity (i.e. eliminates the influence of unobserved factors that raise both income and happiness). Since, instead of lowering it, the instrumenting raises the coefficient on income, it seems to be correcting for measurement error in income. The coefficient on cluster mean income in *column (e)* is somewhat lower than in the uninstrumented case (*column d*); the coefficients on household income and on cluster mean household income are now on a par.

5 Conclusion

The *first* question that we posed was to what extent is it absolute income and to what extent relative income that determines happiness. We found a good deal of evidence that both the income of the household and the income of other households influence subjective well-being. Some of our estimates suggest that the latter relative to the former is more important than the former on its own. *Second*, insofar as relative concepts matter, is it only relative income that counts or are comparisons made in other dimensions as well? The relative concepts that appear to have an effect are unemployment, education and income. However, unemployment and education are to some extent collinear with income. When all three are included, only income remains important. *Third*, if relative income matters, who are the relevant others with whom people compare themselves? We identified three types of reference group. Comparisons are made with the income of other households, the relevant others being based on space, on race, and on previous income.

Fourth, and most importantly, does low income relative to others decrease or increase happiness (i.e. given own income, does the income of relevant others affect happiness negatively or positively)? We found that higher income of other households in a small community raises subjective well-being. This is a powerful new result. We considered four explanations: altruism, mutual insurance, a social wage, and non-causal association. Although suggestive rather than

conclusive, the results of our various tests were consistent with altruism or fellow-feeling, but inconsistent with the alternative explanations. This has interesting policy implications, such as for local taxation. It is not predictable whether our finding that close neighbors are positives applies also in other societies. The study for the United States that found neighbors to be negatives (Luttmer) used too broad a measure of neighborhood to be regarded as contradicting our result. Nevertheless, the peculiar nature of South African society (not only poor and unequal but also racially fractured) may help to produce unusually strong feelings of local solidarity[10].

In posing the fourth question we also examined race as the reference group. We found, in contrast to the spatial result, that higher income of households of the same race is associated with lower subjective well-being. This is consistent with perceptions of relative deprivation (aspirations ahead of achievements) possibly arising from standard setting or notions of unfairness, or envy. It appears that, whereas close spatial proximity (the same cluster) creates a sense of community, close social proximity (the same race) creates feelings of relative deprivation or sets goals and aspirations.

Fifth, does the strength of the positive or negative relationship weaken as the reference group is broadened to include socially more distant people? Our evidence suggested that positive spill-overs on subjective well-being at the local (cluster) level are diluted as orbits of comparison are expanded to include strangers. At the broader (district) level we found that spill-overs are negative. Similarly, perceptions of relative deprivation in relation to persons of the same race are evident not at the local level but at higher levels of geographical aggregation.

Our *sixth* inquiry was to discover whether the importance of relative income varies with absolute income. Indeed, the effect of relative income on happiness is strengthened as income rises. Whereas absolute income is an important determinant of the happiness of people whether they are below or above the poverty-line, relative income is not relevant to the poor. For those who are not poor, however, within-race relative income is important, suggesting that perceptions of relative deprivation play a role.

The finding that South Africans confined themselves to comparisons with others of their own

[10] A recent study, and the only other one to our knowledge, to find neighbors as positives is also for a poor African country, namely Malawi (Ravallion and Lokshin, 2005).

race corresponds to the claim that English slum-dwellers a century ago confined themselves to comparisons within the slum (Roberts). It suggests that people choose their comparator groups by reference to social proximity, possibly to ease their states of mind or to protect self-esteem (in line with Festinger). South Africa in 1993 inherited a legacy of white privilege and black disadvantage. Africans would want to reduce hurt by avoiding comparisons with others whose achieved states were infeasible for them. Similarly, whites would want to assess themselves in relation to other whites, the community of which they felt part; comparisons with blacks would involve loss of face.

Policy-making requires an understanding of reality, including the reality of people's perceptions. Nevertheless, we are hesitant to draw policy conclusions from our results. One reason is the argument of Sen (1983, 1999, and elsewhere) eschewing the 'metric of utilities' in favour of the 'capabilities' approach to addressing poverty; similarly, others regard the fulfilment of 'basic needs' as the appropriate objective. The underlying case against the utilities approach is that, by adjusting their aspirations to reality, people are conditioned to bear hardship. In the words of Sen (1999, p.358),

Utilities can sometimes be very malleable in response to deprivation.

The fact that people adjust themselves as well as possible to their condition does not diminish the case for redressing their condition. Nevertheless, Kingdon and Knight (2006) examine these issues and attempt to justify subjective well-being as a criterion for policy-making. Ultimately, a value judgement is needed.

A second reason can be illustrated by the following case. Consider two households of equal income but of different race. One, being a poor member of a rich race, feels relatively deprived, whereas the other, being a rich member of a poor race, does not. Should policy favour the former? In the South African case we would disagree. We know from the estimates that a white household has a lower probability of being satisfied or very satisfied with life than an African household with equal income, on account of their different race-specific relative positions. However, the difference is more than offset by the negative coefficient on the dummy variable representing African race. This coefficient is likely to reflect the legacy of disadvantages, not all observable in the dataset, that black people suffered under apartheid. It may also represent African relative deprivation in response to the huge between-race income inequalities, which we were unable to capture in our estimates. The negative effect on subjective well-being of being African is best addressed by pro-African policies.

The apartheid policy of divide and rule accentuated racial differences. Our findings suggest that people did not feel themselves to be part of a common society. Such perceptions may have delayed political change in South Africa. Over the last decade, however, a culture of equal rights in a single society has blossomed, a black middle class has burgeoned, and some residential mixing has occurred. If this has widened orbits of comparison, it may have increased feelings of relative deprivation among Africans. It would be interesting to examine the determinants of subjective well-being in South Africa today to discover whether and how reference groups have changed. If Africans now include whites in their reference group, this could be seen as a measure of social progress; the short run increase in dissatisfaction may be a cost that a divided society in transition has to bear, and it may provide the impetus for the transition to a more equitable society.

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Table 1
Variable Definitions

Name	Definition	Mean	s.d.
Dependent variable			
qualife	Perceived satisfaction with life: values from 1 (lowest) to 5 (highest)	2.611	1.30
Control variables			
impass	community roads become impassable at certain times of the year=1 ; 0 otherwise	0.388	0.49
pubtran	community has public transport=1 ; 0 otherwise	0.731	0.44
hhsizem	household size	4.569	2.98
hhnchild	number of children below age 16 within the household	1.853	1.96
migrate	household migrated to its current area within the past 5 years=1 ; 0 otherwise	0.115	0.31
higher	proportion of household members with higher level education	0.075	0.22
hhdaysic	total number of person days that household members were sick in the past 14 days	3.008	6.38
ironroof	house has an iron roof=1 ; 0 otherwise	0.562	0.50
racialm	household is a racial minority in its cluster=1 ; 0 otherwise	0.103	0.30
metropol	household lives in metropolitan city=1 ; 0 otherwise	0.283	0.45
urban1	household in urban non-metropolitan area=1 ; 0 otherwise	0.219	0.41
rural	household lives in rural area=1 ; 0 otherwise (omitted category)	0.498	0.50
homeland	household lives in a former 'homeland'/Bantustan=1 ; 0 otherwise	0.434	0.50
n_victim	number of times in the past 12 months that household members have been victims of crime (robbery, assault, rape, murder, and abduction and 'other')	0.115	0.36
ownship	household lives in owned home=1 ; 0 otherwise	0.651	0.48
debt	household owes any debt=1 ; 0 otherwise	0.447	0.50
nolfpb	*hhurate* – see below - is undefined (missing) for households with no labour force participants (lfp), so for these households, the included variable *hhurate* takes value 0 and the indicator variable *nolfpb* takes the value 1. *nolfpb*=0 for households with >=1 lfp	0.155	0.36
age16-25	proportion of persons within the household aged 16-25	0.198	0.24
age26-35	proportion of persons within the household aged 26-35	0.186	0.28
age36-45	proportion of persons within the household aged 36-45 (omitted category)	0.129	0.23
age46-55	proportion of persons within the household aged 46-55	0.083	0.19
age56-65	proportion of persons within the household aged 56-65	0.059	0.17
age>=66	proportion of persons within the household aged 66 and older	0.051	0.16
Hypothesis variables			
african	race dummy=1 if household is of African race, 0 otherwise	0.746	0.44
coloured	race dummy=1 if household is of Coloured race, 0 otherwise	0.077	0.27
indian	race dummy=1 if household is of Indian race, 0 otherwise	0.029	0.17
white	race dummy=1 if household is of White race, 0 otherwise (omitted category)	0.148	0.35
hhurate	household unemployment rate (i.e. proportion of household labour force participant members that are unemployed)	0.219	0.36
lnhhcpi	natural log of household per capita income	5.575	1.41
assetval	value of assets owned by the household, calculated as follows: assetval=(ncar*8)+(nphone*3)+(nkettle*0.5)+(nradio*0.2)+(nfridge*5)+(nbike*1) +(nestove*0.5)+(ngstove*1)+(ntv*3) +(ngeyser*2), where the preface 'n' before each variable means 'number of'. Thus, ncar is number of cars, ntv means number of TVs, nestove is number of electric stoves and ngstove is number of gas stoves, and so on.	9.561	13.22
c_hhurate*	cluster average of household unemployment rate	0.219	0.16
d_hhurate*	district average of household unemployment rate	0.219	0.14
c_hhedyrs*	cluster average of household mean years of education	7.302	2.19
d_hhedyrs*	district average of household mean years of education	7.303	1.91
c_lnhhpci*	log of cluster average of household per capita income	5.963	1.01
d_lnhhpci*	log of district average of household per capita income	6.059	0.97
lrdm_inc	natural log of the race-specific district mean income (mean of household per capita income of all households of own race within the household's district of residence)	5.945	0.99
r_pciq1	household is in the first quintile of its own race's national distribution of income =1; 0 otherwise (omitted category)	0.200	0.40
r_pciq2	household is in the second quintile of its own race's national distribution of income yes=1	0.200	0.40
r_pciq3	household is in the third quintile of its own race's national distribution of income yes=1	0.200	0.40
r_pciq4	household is in the fourth quintile of its own race's national distribution of income yes=1	0.200	0.40
r_pciq5	household is in the fifth quintile of its own race's national distribution of income yes=1	0.200	0.40

Note: * implies that the average was computed excluding the household's contribution to the average.

Table 2
Models of Perceived Life Satisfaction, Ordered probit and OLS

	(a) Ordered Probit				(b) OLS		
	Coefficient	Robust t		Marginal effect	Coefficient	Robust t	
Control variables							
impass	-0.089	-1.3		-0.020	-0.102	-1.5	
pubtran	0.097	1.6		0.038	0.099	1.6	
hhsizem	-0.019	-1.7	*	-0.007	-0.020	-1.6	
hhnchild	0.049	2.9	***	0.019	0.048	2.7	***
migrate	0.230	2.0	**	0.076	0.252	2.0	**
higher	0.207	2.6	***	0.078	0.218	2.7	***
hhdaysic	-0.005	-2.2	**	-0.001	-0.005	-2.1	**
ironroof	-0.137	-2.1	**	-0.042	-0.158	-2.2	**
racialm	0.242	2.4	***	0.092	0.240	2.2	**
metropol	-0.293	-2.8	***	-0.100	-0.306	-2.9	***
urban1	-0.251	-3.0	***	-0.086	-0.266	-3.1	***
n_victim	-0.090	-2.3	**	-0.031	-0.103	-2.6	***
ownship	0.060	1.3		0.034	0.051	1.1	
debt	-0.062	-1.5		-0.022	-0.063	-1.4	
nolfpb	-0.059	-1.1		0.000	-0.071	-1.2	
age1625	0.343	3.8	***	0.121	0.344	3.6	***
age2635	0.078	1.3		0.023	0.070	1.1	
age4655	0.041	0.5		0.012	0.048	0.6	
age5665	0.134	1.3		0.046	0.124	1.2	
age_66	0.273	2.5	***	0.094	0.288	2.5	***
constant	---	---		---	2.351	12.4	***
Hypothesis variables							
african	-0.663	-6.1	***	-0.215	-0.778	-7.0	***
coloured	-0.270	-2.3	**	-0.077	-0.272	-2.2	**
indian	-0.219	-2.1	**	-0.071	-0.229	-2.2	**
hhurate	-0.221	-4.4	***	-0.052	-0.250	-4.6	***
assetval	0.015	6.3	***	0.005	0.015	6.2	***
lnhhpci	0.116	5.2	***	0.039	0.116	5.3	***
Province dummies	Yes				yes		
Log L	-11136.275				---		
Restricted Log L	-12199.69				---		
Pseudo-R^2 or R^2	0.0872				0.2436		
N	8279				8279		

Notes: the column 'Marginal effect' shows the marginal effect of a variable on the probability of being 'satisfied' or 'very satisfied'. In this, and other, tables, ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively. The reported t-values use standard errors that have been corrected for clustering at the level of the enumeration cluster. Households lived in 357 clusters in this dataset.

Table 3
The Effects of Space-based Comparator Groups on Subjective Well-being

	(a)		(b)		(c)		(d)		(e)		(f)		(g)	
	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t
Hypothesis variables														
african	-0.596	***	-0.595	***	-0.582	***	-0.580	***	-0.473	***	-0.467	***	-0.454	***
	(-5.2)		(-5.2)		(-5.2)		(-5.2)		(-4.2)		(-4.1)		(-3.8)	
coloured	-0.227	*	-0.227	*	-0.199	*	-0.199	*	-0.087		-0.082		-0.072	
	(-1.9)		(-1.9)		(-1.7)		(-1.7)		(-0.8)		(-0.7)		(-0.6)	
indian	-0.208	**	-0.204	**	-0.199	*	-0.195	*	-0.142		-0.132		-0.141	
	(-2.0)		(-2.0)		(-1.9)		(-1.9)		(-1.4)		(-1.3)		(-1.4)	
hhurate	-0.189	***	-0.192	***	-0.224	***	-0.224	***	-0.199	***	-0.200	***	-0.199	***
	(-4.0)		(-4.0)		(-4.4)		(-4.4)		(-3.9)		(-3.9)		(-4.1)	
assetval	0.015	***	0.015	***	0.014	***	0.014	***	0.014	***	0.014	***	0.013	***
	(6.1)		(6.1)		(6.0)		(6.0)		(5.7)		(5.6)		(5.6)	
lnhhpci	0.113	***	0.113	***	0.105	***	0.105	***	0.090	***	0.091	***	0.090	***
	(5.1)		(5.0)		(4.7)		(4.7)		(4.2)		(4.2)		(4.1)	
c_hhurate	-0.499	**	-0.602	**									0.094	
	(-2.0)		(-2.1)										(0.3)	
d_hhurate			0.168										-0.246	
			(0.4)										(-0.5)	
c_hhedyrs					0.052	***	0.056	***					0.005	
					(3.0)		(2.4)						(0.2)	
d_hhedyrs							-0.007						0.021	
							(-0.3)						(0.6)	
c_lnhhpci									0.221	***	0.265	***	0.273	***
									(5.1)		(4.7)		(3.3)	
d_lnhhpci											-0.070		-0.123	
											(-1.2)		(-1.4)	
Log L	-11125.93		-11125.52		-11117.44		-11117.33		-11093.273		-11091.02		-11086.54	
Pseudo-R^2	0.0880		0.0880		0.0885		0.0885		0.0907		0.0909		0.0910	

Notes: The variable definitions are provided in Table 1. All the control variables included in the parsimonious specification of Table 2 are included in each estimate. The addition of the hypothesis variables makes little difference to their coefficients. Therefore only the hypothesis variables are reported. The number of observations in each case is 8,279, and the restricted log L = -12,199.69.

Table 4
OLS Regression of Cluster Coefficients on Cluster and District Variables

	Coefficient	t-value	
Hypothesis variables			
pub_tran	-0.0341	-0.40	
distrans	-0.0038	-1.19	
numfaci	0.0018	0.48	
disfaci	0.0003	1.04	
impass	-0.0679	-0.84	
tarroad	0.1150	1.13	
c_lnhhcpi	0.3401	6.61	***
Control variables			
wcape	0.6552	4.96	***
ncape	1.1453	4.60	***
ecape	0.4037	2.73	***
natal	0.6492	4.85	***
ofs	0.3693	2.18	**
etvl	0.6045	3.53	***
ntvl	0.5351	3.22	***
nw	0.1509	0.93	
homeland	0.1420	1.32	
metropol	-0.2469	-1.88	*
urban1	-0.1687	-1.67	*
_cons	-1.5506	-4.42	***
N	327		
Adjusted R^2	0.2568		
Mean of dependent variable	0.8235		

Note: The dependent variable is the coefficient on cluster dummies in the ordered probit equation of subjective well-being in Table 2. The cluster amenity variables are jointly insignificant [F = 0.73; p-value of F test = 0.625]. Impass and pubtran were cluster amenity variables defined in Table 1. The other cluster amenity variables are distrans = distance to nearest source of public transport; numfaci = number of community facilities available within the cluster; disfaci = total distance to various facilities from cluster; tarroad = whether the cluster roads are tarred. 'Facilities' within the cluster were amenities such as bank, public telephone, market, health clinic, and post-office.

Table 5
The Effects of Race-based Comparator Groups on Subjective Well-being

	(a)		(b)		(c)		(d)	
	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t
african	-0.467	-4.1 ***	-0.617	-4.0 ***	-0.616	-4.2 ***	-0.710	-5.8 ***
coloured	-0.082	-0.7	-0.203	-1.5	-0.202	-1.5	-0.250	-2.0 **
indian	-0.132	-1.3	-0.198	-1.7 *	-0.197	-1.7 *	-0.236	-2.2 **
hhurate	-0.200	-3.9 ***	-0.189	-3.7 ***	-0.189	-3.7 ***	-0.188	-3.7 ***
assetval	0.014	5.6 ***	0.014	5.7 ***	0.014	5.7 ***	0.013	5.2 ***
lnhhpci	0.091	4.2 ***	0.104	5.3 ***	0.104	5.3 ***	0.010	0.3
c_lnhhpci	0.265	4.7 ***	0.296	5.2 ***	0.297	5.9 ***	0.260	4.6 ***
d_lnhhpci	-0.070	-1.2	0.003	0.0			-0.069	-1.2
lrdm_inc			-0.170	-1.9 *	-0.168	-2.1 **		
r_pciq2							0.105	2.2 **
r_pciq3							0.105	1.8 *
r_pciq4							0.276	3.6 ***
r_pciq5							0.319	2.8 ***
Log L	-11091.02		-11083.29		-11083.29		-11080.53	
Pseudo R^2	0.0909		0.0915		0.0915		0.0917	

Notes: as for Table 3. Column (a) repeats column (f) of Table 3.

Table 6
Subjective Well-being, by Poverty Status

	Below poverty line			Above poverty line		
	Coeff.	Robust-t		Coeff.	Robust-t	
Control variables						
age1625	0.267	2.2	**	0.357	3.3	***
age2635	0.140	1.1		0.039	0.6	
age4655	-0.070	-0.4		0.057	0.7	
age5665	0.172	1.0		0.106	0.8	
age_66	0.125	0.6		0.357	2.5	***
hhdaysic	-0.008	-2.9	***	-0.001	-0.2	
hhurate1	-0.121	-2.2	**	-0.309	-3.1	***
nolfpb	0.030	0.5		-0.045	-0.4	
assetval	0.018	4.6	***	0.012	4.4	***
african	-0.012	0.0		-0.802	-4.8	***
coloured	0.011	0.0		-0.280	-1.8	*
indian	-0.038	-0.1		-0.229	-1.8	*
n_victim	-0.188	-3.1	***	-0.042	-0.9	
ownship_	0.126	2.0	**	0.072	1.5	
debt	-0.081	-2.0	**	-0.068	-1.3	
Hypothesis variables						
lnhhpci	0.091	3.6	***	0.132	3.3	***
c_lnhhpci	0.164	2.0	**	0.351	5.7	***
d_lnhhpci	0.014	0.2		0.092	1.2	
lrdm_inc	0.026	0.3		-0.385	-3.7	***
N	4142			4137		
Log L	-5302.997			-5636.746		
Restr. LogL	-5540.3536			-6238.7515		
Psuedo-R^2	0.0428			0.0965		

Note: The poverty line used is the Household Supplementary Level, which was Rand 251 per month in 1993. The estimated equations are the parsimonious specification of Table 2 plus the measures of relative income. Only these measures plus the noteworthy control variables are reported. Province dummies included but not reported.

Table 7
Subjective Well-Being Equation, OLS and IV estimates

	(a) Ordered probit with deflated income		(b) Ordered probit with deflated income		(c) OLS		(d) OLS		(e) IV	
	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t	Coeff.	Robust-t
Control variables										
impass	-0.080	-1.2	-0.044	-0.7	-0.042	-0.6	--	--	--	--
pubtran	0.090	1.5	0.081	1.4	0.080	1.3	--	--	--	--
hhsizem	-0.020	-1.7	-0.018	-1.6	-0.016	-1.3	-0.001	-0.1	0.001	0.1
hhnchild	0.047	2.8	0.048	2.7	0.049	2.8	0.037	2.1	0.057	3.0
migrate	0.225	1.9	0.214	1.8	0.237	1.8	0.234	1.7	0.229	1.6
higher	0.229	2.8	0.223	2.8	0.196	2.5	0.292	3.6	0.200	2.2
hhdaysic	-0.005	-2.1	-0.005	-2.1	-0.005	-1.9	-0.005	-2.1	-0.005	-2.0
ironroof	-0.136	-2.0	-0.105	-1.6	-0.119	-1.7	--	--	--	--
racialm	0.253	2.5	0.237	2.6	0.208	2.2	0.166	2.0	0.162	1.8
metropol	-0.279	-2.6	-0.316	-2.2	-0.356	-3.0	-0.278	-2.4	-0.289	-2.4
urban1	-0.234	-2.7	-0.260	-2.4	-0.300	-3.2	-0.254	-2.8	-0.268	-2.8
n_victim	-0.092	-2.3	-0.093	-2.4	-0.108	-2.7	-0.103	-2.6	-0.115	-2.8
ownship	0.067	1.4	0.095	2.2	0.103	2.4	0.152	3.3	0.134	2.8
debt	-0.063	-1.5	-0.063	-1.5	-0.058	-1.3	-0.047	-1.0	-0.063	-1.4
nolfpb	-0.078	-1.4	-0.062	-1.1	-0.035	-0.6	-0.032	-0.5	0.065	1.0
age1625	0.358	4.0	0.359	4.0	0.348	3.8	0.295	3.3	0.315	3.6
age2635	0.078	1.3	0.066	1.1	0.054	0.9	0.000	0.0	-0.044	-0.7
age4655	0.027	0.3	0.026	0.3	0.040	0.5	0.028	0.3	0.011	0.1
age5665	0.171	1.6	0.180	1.7	0.125	1.2	0.102	0.9	0.059	0.5
age_66	0.300	2.6	0.313	2.8	0.287	2.5	0.233	2.0	0.117	1.0
Hypothesis variables										
african	-0.686	-6.2	-0.549	-4.1	-0.561	-4.8	-0.803	-7.2	-0.721	-5.9
coloured	-0.284	-2.4	-0.168	-1.3	-0.068	-0.6	-0.165	-1.3	-0.114	-0.9
indian	-0.231	-2.2	-0.167	-1.6	-0.137	-1.3	-0.187	-1.9	-0.140	-1.4
hhurate	-0.244	-4.7	-0.235	-4.4	-0.226	-4.2	-0.236	-4.3	-0.101	-1.5
assetval	0.016	6.3	0.015	5.8	0.014	5.5	--	--	--	--
lnhhpci	0.095	3.1	0.073	3.2	0.089	4.2	0.120	5.9	0.252	5.4
c_lnhhpci	--	--	0.175	3.0	0.274	4.7	0.327	5.6	0.278	4.4
d_lnhhpci	--	--	-0.054	-0.7	-0.053	-0.9	-0.060	-1.0	-0.069	-1.1
constant	--	--	--	--	0.913	2.3	0.635	1.4	0.135	0.3
R^2 / psuedo-R^2	0.0891		0.0891		0.2523		0.2437		0.2378	
N	8225		8225		8279		8279		8229	

Notes: Province dummies are included in all specifications. *Lnhhpci* is instrumented with log of household per capita expenditure (*lnhhpce*) in the IV regressions. In the first column, *lnhhpci* used is deflated by the cluster food price index.

Appendix Table 1
The Determinants of the Household's Subjective Well-being
Including the Individual Respondent's Personal Characteristics

	Ordered probit equation from Table 2 (a)		Plus personal characteristics of the household respondent (b)	
	Coefficient	Robust-t	Coefficient	Robust-t
Control variables				
impass	-0.089	-1.3	-0.093	-1.4
pubtran	0.097	1.6	0.099	1.6
hhsizem	-0.019	-1.7 *	-0.013	-1.1
hhnchild	0.049	2.9 ***	0.040	2.4 ***
migrate	0.230	2.0 **	0.235	2.0 **
higher	0.207	2.6 ***	0.244	2.8 ***
hhdaysic	-0.005	-2.2 **	-0.005	-2.1 **
ironroof	-0.137	-2.1 **	-0.131	-2.0 *
racialm	0.242	2.4 ***	0.240	2.4 ***
metropol	-0.293	-2.8 ***	-0.299	-2.8 ***
urban1	-0.251	-3.0 ***	-0.252	-3.1 ***
n_victim	-0.090	-2.3 **	-0.093	-2.4 **
ownship	0.060	1.3	0.063	1.4
debt	-0.062	-1.5	-0.062	-1.5
nolfpb	-0.059	-1.1	-0.038	-0.7
age1625	0.343	3.8 ***	0.272	2.9 ***
age2635	0.078	1.3	0.031	0.5
age4655	0.041	0.5	0.087	1.1
age5665	0.134	1.3	0.207	1.9 *
age_66	0.273	2.5 ***	0.343	2.8 ***
Hypothesis variables				
african	-0.663	-6.1 ***	-0.657	-6.1 ***
coloured	-0.270	-2.3 **	-0.254	-2.2 *
indian	-0.219	-2.1 **	-0.206	-1.9 *
hhurate	-0.221	-4.4 ***	-0.210	-4.0 ***
assetval	0.015	6.3 ***	0.016	6.5 ***
lnhhpci	0.116	5.2 ***	0.120	5.3 ***
Personal characteristics of respondent				
r_age			-0.010	-1.9 *
r_agesq			0.000	1.3
r_edyrs			-0.005	-0.4
r_edyrsq			0.000	-0.1
r_male			-0.010	-0.3
r_empld			0.018	0.5
Province dummies	yes		yes	
LogL	-11136.28		-11003.83	
Restr LogL	-12199.69		-12063.84	
Psuedo-R^2	0.0872		0.0879	
N	8279		8190	

Note: *r_age* and *r_agesq* are respondent's age and its square; *r_edyrs* and *r_edyrsq* are respondent's years of education and its square; *r_male* is gender and *r_empld* whether the respondent is employed or not.